Longer-Lived Lithium Batteries with Anodes Featuring Circuitous Hopscotch Paths for Spin-Orientation Randomization for Anode Distortion Prevention

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Introduction

Now that magnetic exertion of flowing electrons has been identified as the likely culprit in anode distortion, I have a new proposal for slowing or eliminating this distortion process that has thus far limited the useful life of batteries.

Abstract

This exertion cannot be eliminated in a cost effective way by chilling batteries as this is not cost-effective and would, of course, freeze a liquid electrolyte. If we constructed anodes only out of topological insulators, we could control spin orientation at the expense of the bulk of the electrical storage capacity of a typical anode, making that approach wrong-minded. Instead, I propose introducing a randomization of spin orientations during charge or discharge that will extend battery life substantially. I propose to achieve this in the following way:

The construction of anodes using lithium with a crystalline structure with specific patterns of relative orientation within the anode. These crystals would be cubes with a lattice structure that would nearly, but not perfectly align with the next cube. Imagine a hopscotch path of a circuitous nature but only a single square of thickness. The path curves as the angular orientation of individual cubes vary by only a few degrees per cube. Many of these curved paths would be introduced to the anode through the introduction of randomized electrical currents during the manufacturing process. The paths would also bear a resemblance to the path that electricity follows, which makes sense since this is the most logical way to bring about the configuration in the first place. These patterns could be generated while the anode is in a barely-molten state and preserved by simply allowing the temperature to drop to below the melting point.

These circuitous paths would still allow energy to flow in the originally intended direction, but would redirect some of that energy in different directions. In so doing, electrons flowing in opposite directions would affect the spin orientation of all other local electrons. In a traditional lithium anode, spin orientations are largely consistent, acting as the leg of a chair wearing a hole in carpeting. With these spin randomization loops, equal force is exerted from multiple directions at the same time. In this way, distortion is actually reduced despite more electrons passing through the device. This is analogous to the difference between trying to write on a piece of paper with a pencil and no firm surface to write on, resulting in the puncture of the paper, and having a nice, firm surface for your stationery.

Conclusion

If realized, this approach, per my estimates, would quadruple the life of lithium batteries, taking them from being the most failure-prone and expensive aspect of consumer electronics to perhaps the most durable.